

Laparoscopic-Assisted Staging Surgery for Korean Women With Endometrial Cancer

Jung Hun Lee, MD, Un Suk Jung, MD, Min Sun Kyung, MD, Joong Sub Choi, MD

ABSTRACT

Background and Objective: In recent years, the incidence of endometrial cancer has gradually increased in Korea, and the use of laparoscopically assisted staging surgery (LASS) is increasing in this field. We conducted this study to evaluate the feasibility of LASS in Korean women with endometrial cancer.

Methods: We conducted a retrospective review of 35 Korean women with endometrial cancer who were managed laparoscopically.

Results: The median age and BMI were 57 years (range, 28 to 81) and 25.8 kg/m² (range, 20.9 to 37.2), respectively. The median operating time, estimated blood loss, and length of hospital stay were, respectively, 150 minutes (range, 95 to 410), 250 mL (range, 50 to 1000), and 8 days (range, 3 to 20). No conversion to laparotomy was noted. The median number of harvested lymph nodes was 22 (range, 10 to 41) in pelvic lymph nodes and 7 (range, 2 to 21) in paraaortic lymph nodes. No vault recurrence or port-site metastasis was noted until the last follow-up.

Conclusions: LASS can be performed without additional morbidity and complications, and might be feasible in Korean women with endometrial cancer.

Key Words: Endometrial cancer, Laparoscopy, Lymphadenectomy.

INTRODUCTION

Since Childers et al¹ initially reported the laparoscopic surgical management of 2 cases of stage I endometrial cancer, many studies have advocated the advantages of laparoscopically assisted staging surgery (LASS) compared with laparotomic staging surgery in women with endometrial cancer. Laparoscopic surgical management has comparable clinical outcomes to those of conventional laparotomy; it results in less pain and bleeding, shorter hospital stay, and faster recovery to normal activities thus improving quality of life.²⁻¹²

Of gynecologic malignancies, endometrial cancer is the third most prevalent following cervical cancer and ovarian cancer in Korean women. In recent years, the incidence of endometrial cancer has gradually increased.¹³

In the present study, to examine feasibility, effectiveness, and any complications of LASS in Korean women with endometrial cancer, we reviewed women who underwent LASS and compared our operative data results with those of other studies.

METHODS

Of 39 women who were diagnosed with endometrial cancer at Kangbuk Samsung Hospital between August 2003 and November 2007, we excluded 4 women who refused to undergo laparoscopic surgery or were ineligible for laparoscopic surgery because of concurrent cardiopulmonary diseases; a final number of 35 women were enrolled in the present study. The preoperative workup included medical history, physical examination, pelvic examination, gynecologic ultrasonography, Pap smear, endometrial biopsy, and MRI. The previous abdominal surgical history and body mass index (BMI) did not affect our decision to perform staging surgery in all women. After being informed of the characteristics depending on the extent of surgery, such as complications and their incidence, and the necessity of staging surgery, each woman gave informed consent. The operating time was defined as the period from trocar insertion to closure of the port site.

Before August 2005, when American College of Obstetri-

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cians and Gynecologists (ACOG) clinical guidelines for management of endometrial cancer was published,¹⁴ 10 women with endometrial cancer were managed by laparoscopically assisted vaginal hysterectomy (LAVH) and bilateral salpingo-oophorectomy (BSO) with laparoscopic pelvic lymphadenectomy (LPL). Laparoscopic paraaortic lymphadenectomy (LPAL) was then added to LAVH and BSO with LPL after August 2005. However, the decision to perform LPAL was not influenced by adhesion and obesity.

LASS was performed according to the following procedure. Intravenous preoperative prophylactic antibiotics were administered: cefminox 2 g or flomocel 1 g if a woman was allergic to cephalosporins. Preoperative bowel preparation with Fleet Phospho-soda was done in all cases. Women were placed in a dorsal lithotomy position and given general anesthesia with endotracheal intubation, and the surgical preparation was performed aseptically using Povidone-iodine. The port placement system was established through Choi's 4-trocar method,¹⁵ and the intraabdominal pressure was maintained at 15mm Hg. After the entire abdominal and pelvic cavities were thoroughly examined, peritoneal washing cytology was performed; multiple biopsies were performed for any suspected area in the abdominal cavity. To prevent the retrograde spread of cancer cells through both tubes, the tube containing both round and ovarian ligaments was ligated by the extracorporeal endosuture technique (Suture LapLoop, Sejong Medical, Seoul, Korea.). Subsequently, a uterine elevator (Uterine grasping forceps by Saarges, WOLF, Germany) was inserted. Prior to LAVH, LPL was systemically performed from the level corresponding to the deep circumflex iliac vein to the level of the ureter crossing the common iliac artery. While LPAL was being performed, neither additional trocar insertion nor positional change of the operator or a monitor, or both, was done. LPAL was performed to the level of the left renal vein using a dissector with monopolar coagulator and Harmonic shears (Ultracision Harmonic Scalpel, Ethicon Endo-Surgery, Cincinnati, OH) (**Figure 1**). The dissected lymphatic tissues were safely removed through the opened vaginal vault after LAVH with BSO.

Following the completion of all surgical procedures, drainage (Evacuator Barovac, Sewoon Medical, Seoul, Korea) was inserted after confirming ureteric peristalsis and that no bleeding was occurring at the trocar site or in the abdominal cavity. To minimize the "chimney effect," CO₂ gas was released gradually and completely. After removing the trocars, the trocar sites were dressed with Povidone-iodine, and the sites of skin incision were sutured.

Statistical Analysis

Data are expressed as the median and range. The Student *t* test was used to compare the number of harvested lymph nodes between the right and left pelvic lymph node. $P < 0.05$ was taken to indicate a significant difference. All statistical analyses were performed using SAS version 9.1 (SAS Institute Inc., Cary, NC, USA).

RESULTS

The median age and BMI were 57 years (range, 28 to 81) and 25.8 kg/m² (range, 20.9 to 37.2). Eighteen women (51.4%) had some concomitant medical disease: hypertension in 12 women (34.3%), diabetes in 8 (22.9%), ischemic heart disease in 1 (2.9%), and other medical diseases in 3 (8.6%). Fourteen women (40.0%) had a history of previous abdominal surgery: laparoscopic tubal ligation in 8 women (22.9%), cesarean delivery in 5 (14.3%), appendectomy in 2 (5.7%), tubal reversal in 1 (2.9%), and salpingectomy due to tubal pregnancy in 1 (2.9%). Operative techniques included LAVH with BSO in 1 patient (2.9%) who was a 76-year-old woman with Parkinson's disease, cerebrovascular accident, diabetes, and hypertension; LAVH with BSO combined with LPL in 9 (25.7%); LAVH with BSO combined with LPL and LPAL in 24 (68.6%); hysteroscopic tumorectomy with LPL in 1 (2.9%) for fertility conservation¹⁶; laparoscopic modified radical vaginal hysterectomy with BSO, LPL, and LPAL in one (2.9%) with an MRI finding that tumor had invaded the uterine cervix.¹⁷ Median operating time and estimated blood loss were 150 minutes (range, 95 to 410) and 250mL (range, 50 to 1,000), respectively. No conversion to laparotomy was noted. Intraoperative complications included 1 case (2.9%) of inferior vena cava laceration, in which laparoscopic primary repair was done using a Prolene 5-0 suture. Thereafter, no additional complications were reported. Postoperative complications were noted in 3 women (8.6%): lymphocyst in 1 woman, lymphedema of the right leg in 1, and a high fever (>38° C) within 48 postoperative hours in one. In these 3 cases, the symptoms improved with conservative therapy. Median length of hospital stay was 8 days (range, 3 to 20). Peritoneal washing cytology was negative in all women. The median number of harvested lymph nodes was 22 (range, 10 to 41) in pelvic lymph nodes; 12 (range, 5 to 21) in right pelvic lymph nodes; 11 (range, 4 to 21) in left pelvic lymph nodes; and 7 (range, 2 to 21) in paraaortic lymph nodes. No statistical difference was found in the number of harvested lymph nodes between the right and left pelvic lymph node ($P = 0.9523$). Three women had his-

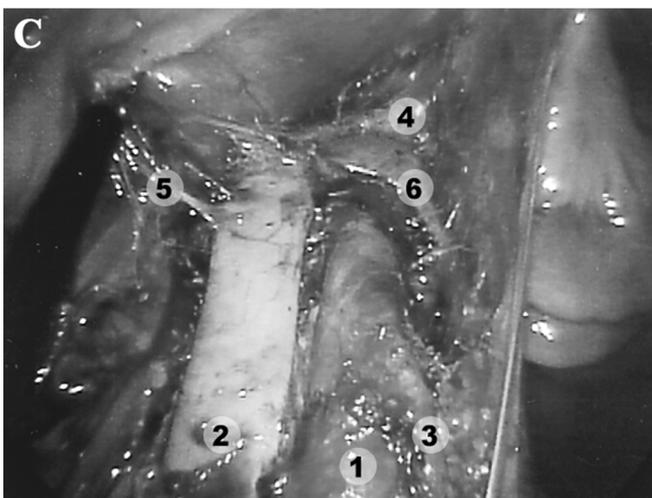
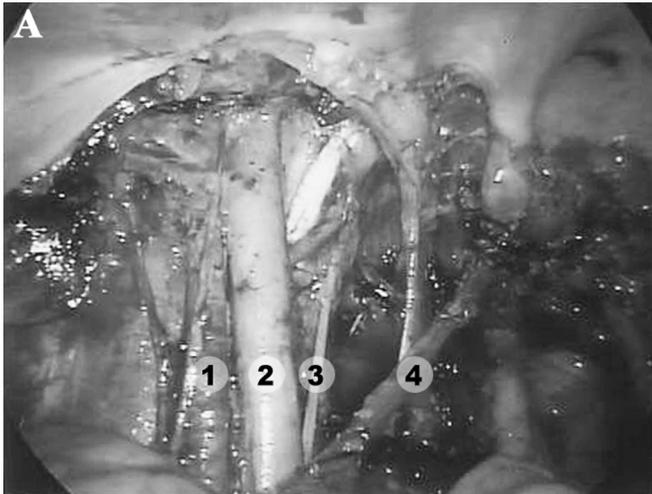


Table 1.
Histopathological Results

Histology	Number (%)
Endometrioid	31 (88.6)
Mixed	2 (5.7)
Endometrioid & mucinous	1 (2.9)
Papillary and poorly differentiated	1 (2.9)
Malignant Mixed Müllerian Tumor	2 (5.7)
Grade	
G1	26 (74.3)
G2	7 (20.0)
G3	0 (0)
FIGO Stage	
Ia	19 (54.3)
Ib	4 (11.4)
Ic	3 (8.6)
IIa	1 (2.9)
IIb	3 (8.6)
IIIc	5 (14.3)

topathological findings of pelvic lymph node metastasis. Two women had a histopathological finding of paraaortic lymph node metastasis. No women had both pelvic and paraaortic lymph node metastases.

The detailed histopathological results and FIGO stage are shown in **Table 1**. In postoperative adjuvant treatment, 5 women in stage IIIc were treated through chemo-radiation therapy with paclitaxel and carboplatin.¹⁸ Ten women without lymph node metastasis beyond stage Ib were treated with external radiation therapy or vault radiation. For one woman who underwent hysteroscopic tumorectomy with LPL for fertility conservation, medroxyprogesterone acetate (500 mg/day) was prescribed for 16 months.¹⁹

Median follow-up was 22 months (range, 1 to 47). No vault recurrence or port-site metastases were noted until the last follow-up. Distant metastasis was found in the

Figure 1. An actual laparoscopic image after laparoscopic transperitoneal lymphadenectomy. **A:** (1) left external iliac artery, (2) left external iliac vein, (3) left obturator nerve, (4) left ureter. **B:** (1) right external iliac artery, (2) right external iliac vein, (3) right obturator nerve, (4) right ureter. **C:** (1) aorta, (2) inferior vena cava, (3) inferior mesenteric artery, (4) left renal vein, (5) right ovarian vein, and (6) left ovarian vein.

lung of a woman 34 months postoperatively; palliative chemotherapy is currently in process.

DISCUSSION

Since 1988, laparotomic staging surgery via a midline incision has been done in women with endometrial cancer. The staging surgery included total abdominal hysterectomy with bilateral salpingo-oophorectomy, peritoneal washing cytology, the sampling of paraaortic and pelvic lymph nodes, and the dissection.²⁰ Since then, total vaginal hysterectomy has been considered an alternative surgical modality to laparotomy in a high-risk group of women; however, it has several disadvantages as a surgical

approach.²¹ Laparoscopic staging surgery has overcome these disadvantages by causing less pain, shorter hospital stay, and in addition, providing the ability to inspect the abdominal cavity.²⁻¹²

A meta-analysis of many studies concerning laparoscopic surgery for endometrial cancer reports the problems due to the differences in the patient groups, surgical methods, surgeons' high technical expertise, and the extent and frequency of lymph node dissection. **Table 2** summarizes results from previous studies regarding FIGO stage, the extent and frequency of lymph node dissection, the number of harvested lymph nodes, complications, operating time, the amount of bleeding, and the length of hospital

Table 2.
Comparisons of Previous Studies on Laparoscopic Surgery of Endometrial Cancer*

Study	No. of Patients	Stage	Number of Harvested LN†	Number (%) W/ Complications†	Operative Time (min)	EBL (mL)	Hospital Stay (days)
Malur et al (2001) ²	37	I-III	Pelvic LN: 16.1(±7.6) Paraaortic LN: 9.6(±7.6)	11 (29.7)	176.4 (±85.4)	229.2 (±190.2)	8.6 (±2.7)
Eltabbakh et al (2001) ³	86	I-IV	Pelvic LN: 10.8(±5.0) Paraaortic LN: 2.7(±1.9)	IOC: 2(2.3) POC: 8(9.3)	190.5 (±48.9)	278.3 (±207.2)	2.5 (±2.4)
Fram (2002) ⁴	29	I	Pelvic LN: 21.3 Paraaortic LN: none	3 (10.3)	136.2	145.5	2.3
Tozzi et al (2005) ⁵	63	I-III	Pelvic LN: 19.3(13-37) Paraaortic LN: 12.3(10-21)	-	-	241.3	7.8
Sobiczewski et al. (2005) ⁶	45	I-III	8(2-21)	11(23)	120 (67-240)	-	5 (2-13)
Zapico et al (2005) ⁷	38	I-II	Pelvic LN: 15.06(±1.44) Paraaortic LN: none	IOC: 5(13.2) POC: 7(18.4)	164.91 (±5.60)	-	5.04 (±2.7)
Wong et al (2005) ⁸	19	I-III	Pelvic LN: 26.1 (±11.0) Paraaortic LN: none	IOC: 0(0) POC: 2(10.5)	211 (±32)	200 (±78)	3 (2-8)
Ghezzi et al (2006) ⁹	37	I-IV	Pelvic LN: 18(7-31) Paraaortic LN: none	IOC: 3(8.1) POC: 7(18.9)	213.2 (±39.4)	150 (50-450)	3 (1-6)
Frigerio et al (2006) ¹⁰	55	I-III	Pelvic LN: 18.5 Paraaortic LN: none	IOC: 2(3.6) POC: 6(10.9)	220 (80-375)	285 (100-800)	4
Gil-Moreno et al (2006) ¹¹	55	I-III	Pelvic LN: 16.64(±5.6) Paraaortic LN: 7.04(±3.4)	IOC: 2(4.7) POC: 6(14.3)	192 (±38.5)	250 (100-700)	4 (2-13)
Current Study	35	I-III	Pelvic LN: 22(10-41) Paraaortic LN: 7(2-21)	IOC: 1(2.9) POC: 3(8.6)	150 (95-410)	250 (50-1000)	8 (3-20)

*Data are presented as median (range) or mean ± SD.

†LN = Lymph node; IOC = Intraoperative complication; POC = Postoperative complication; EBL = Estimated blood loss.

stay. Despite the increased number of patients who underwent LPL and LPAL compared with those in the previous studies, no significant differences were found in the incidence of complications, the amount of bleeding, and the median number of harvested lymph nodes. However, the median operating time seems relatively shorter. Several factors might be involved in determining the operating time, but the following matters contributed to shortening the operating time in our series. Korean women with endometrial cancer have lower BMI than do western women. Through the 4-trocar method,¹⁵ laparoscopic surgeons can obtain better surgical vision and manipulate instruments easily; additionally, despite the extended scope of lymph node dissection, no additional insertion of trocars was necessary, and the operator and monitor were not required to move or be moved for LPAL. In our series, median BMI was 25.8kg/m² (range, 20.9 to 37.2). One woman (2.9%) had a high degree of obesity (BMI>35kg/m²), and 2 women (5.7%) were obese (BMI>30kg/m²). Kim et al²² reported that mean BMI was 23.1kg/m² in Korean women ≥20 years of age. According to these authors, women with a high degree of obesity were rare compared with those in a Western population. Our findings support these reports, and such findings were assumed to shorten the operating time. However, mean length of hospital stay was relatively longer. Presumably, this might be due to the structural problems of the health insurance system as well as the tendency of Korean women wanting to be discharged after complete recovery of their normal activities.

In addition, some controversial issues have been raised regarding the management of endometrial cancer using LASS; these include the intraabdominal dissemination of cancer cells (eg, the increase in positive peritoneal washing cytology), port-site metastasis, and the recurrence of vaginal vault, which are all caused by intraabdominal leakage due to the use of a uterine elevator.^{23–25} To prevent the intraabdominal leakage of cancer cells and port-site metastasis, we ligated both oviducts by using the extracorporeal endosuture technique before insertion of the uterine elevator. After trocar insertion, the trocars were tightly fixed with precaution to assure affixation, and all the extracts were removed via the vaginal route. Intraoperative peritoneal washing cytology was negative. To date, no cases of port-site metastasis or vaginal vault recurrence have been reported.

CONCLUSION

Although continuing a large, prospective, and randomized study is necessary, we believe that LASS can be performed

without additional morbidity and complications, and is feasible and effective in Korean women with endometrial cancer.

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